

CLAIMS

What is claimed is:

1. An apparatus for supplying a voltage to a plurality of developer units, comprising:
a high voltage source to generate a voltage;
a voltage switching unit comprising:
a plurality of switching elements provided between the plurality of developer units and the high voltage source to sequentially supply the voltage from the high voltage source to the plurality of developer units, the high voltage source supplying one voltage of a predetermined voltage level to respective switching elements of the voltage switching unit, and
a plurality of a high voltage distributing units to branch the voltage supplied to the switching elements into one or more voltages of differing voltage levels, and to supply the branch voltages and the one voltage of the predetermined voltage level to the respective developer units.
2. The apparatus of claim 1, wherein each of the high voltage distributing units comprises:
an output terminal of the voltage switching unit to connect with a respective one of stationary contact-point terminals of each of the developer units;
a reference voltage transmitting unit to transmit the one voltage, between the output terminal of the voltage switching unit and a corresponding one of the switching elements;
one or more remaining output terminals of the voltage switching unit; and
one or more branch voltage generating units arranged in parallel with the reference voltage transmitting unit and connected to the one or more remaining output terminals of the voltage switching unit and comprising one or more zener diodes, the remaining output terminals of the voltage switching unit being connected with remaining ones of the stationary contact-point terminals of each of the developer units which require high voltage.
3. The apparatus of claim 2, wherein each of the branch voltage generating units comprise:
two zener diodes arranged in a series thereof.

4. The apparatus of claim 3, wherein:

the voltage switching unit comprises a printed circuit board; and
the switching elements comprise solenoids.

5. An apparatus for supplying voltages to developer units, comprising:

a high voltage source to generate a voltage;

a voltage switching unit comprising:

a plurality of switching elements provided between the plurality of developer units and the high voltage source to sequentially supply the voltage from the high voltage source to the plurality of developer units, the high voltage source supplying one voltage of a predetermined voltage level to the respective switching elements of the voltage switching unit; and

a plurality of the developer units, each comprising a high voltage distributing unit to branch the one voltage supplied via the corresponding switching element into one or more branch voltages, and to supply the one or more branch voltages and the one supplied voltage.

6. The apparatus of claim 5, wherein:

the voltage switching unit further comprises an output terminal thereof to connect with each of the switching elements; and

each of the high voltage distributing unit comprises:

an input terminal thereof;

a reference voltage transmitting unit to transmit the one voltage between the input terminal of the developer unit and one of contact-point terminals of the developer unit which require high voltage, the input terminal of the developer unit being connected with the output terminal of the voltage switching unit which is connected with each of the switching elements; and

one or more branch voltage generating units arranged in parallel with the reference voltage transmitting unit, and connected with remaining ones of the contact-point terminals of the developer unit which require high voltages, and each of the branch voltage generating units having one or more zener diodes.

7. The apparatus of claim 6, wherein the branch voltage generating unit comprises two zener diodes arranged in a series thereof.

8. The apparatus of claim 7, wherein:

the voltage switching unit comprises a printed circuit board; and
the switching elements comprise solenoids.

9. An apparatus for supplying voltages to a plurality of developer units, and having a high voltage source to generate a voltage, comprising:

a plurality of switching elements provided between the plurality of developer units and the high voltage source to sequentially supply the voltage to the plurality of developer units, the high voltage source to supply a voltage of a predetermined voltage level to a respective one or ones of the plurality of switching elements, and

high voltage distributing units to branch the voltage supplied to the switching elements into one or more voltages of differing voltage levels, and to supply the branch voltages together with the voltage of the predetermined voltage level to a respective one or ones of the developer units.

10. The apparatus of claim 9, wherein each of the high voltage distributing units comprises:

a transmitting unit connected to the voltage source to transmit the voltage of the predetermined voltage level to a corresponding one or ones of the switching elements;

one or more voltage generating units arranged with the transmitting unit and reducing the voltage of the predetermined voltage level to different voltage levels to supply voltages of the different voltages level to a respective one or ones of the developer units.

11. The apparatus of claim 10, wherein each of the high voltage distributing units further comprises:

an output terminal of the transmitting unit to connect with a respective one of terminals of each of the developer units; and

one or more output terminals of the one or more voltage generating units, respectively, to connect with one or more remaining output terminals of the developer unit.

12. The apparatus of claim 11, wherein each of the voltage generating units comprise:

a voltage reducing unit to reduce the voltage of the predetermined voltage level to a voltage of a reduced voltage level such that each of the voltages supplied to the developer unit differs in a voltage level thereof.

13. The apparatus of claim 11, wherein each of the voltage generating units comprise: one or more zener diodes connected in a series with the transmitting unit to supply a voltage to the one or more remaining output terminals of the developer unit.

14. The apparatus of claim 13, wherein each of the voltage generating units comprises: two zener diodes arranged in a series thereof.

15. The apparatus of claim 14, wherein:
the voltage switching unit comprises a printed circuit board; and
the switching elements comprise solenoids.

16. The apparatus of claim 9, wherein the high voltage distribution units provide at least three different voltage levels to each of the developer units.

17. The apparatus of claim 13, wherein, in each of the branch voltage generating units, a number of series arranged zener diodes is determined according to a constant voltage required by one of developer rollers and developer feed rollers.

18. An apparatus for supplying voltages to development units, and having a high voltage source to generate a voltage, comprising:

a plurality of switching elements provided between the plurality of developer units and the high voltage source to sequentially supply the voltage to the plurality of developer units, the high voltage source to supply a voltage of a predetermined voltage level to the plurality of switching elements; and

a plurality of developer units, each comprising
plural high voltage distributing units to branch the voltage of the predetermined voltage level supplied via the corresponding switching element into one or more branch voltages, and to supply the one or more branch voltages together with the voltage of the predetermined voltage level therein.

19. The apparatus of claim 18, wherein:
the plurality of switching elements, each comprise
an output terminal thereof; and
each of the high voltage distributing unit comprises:
an input terminal of the developer unit to connect with an output terminal of a
corresponding switching element,
a transmitting unit to transmit the voltage of the predetermined voltage level
between the input terminal of the developer unit and one of contact-point terminals of the
developer unit which require high voltage, and
one or more branch voltage generating units arranged with the transmitting unit,
and connected with remaining ones of the contact-point terminals of the developer unit, and
having one or more zener diodes.
20. The apparatus of claim 19, wherein the branch voltage generating unit comprises
two zener diodes arranged in a series thereof.
21. The apparatus of claim 20, wherein, in each of the branch voltage generating units,
a number of series arranged zener diodes is determined according to a constant voltage
required by one of developer rollers and developer feed rollers.
22. The apparatus of claim 19, wherein:
the voltage switching unit comprises a printed circuit board; and
the switching elements comprise solenoids.
23. The apparatus of claim 18, wherein the high voltage distribution units provide at
least three different voltage levels to each of the developer units.